News release

29 August 2007

Higher river levels as more CO2 makes plants less thirsty

Rising carbon dioxide levels will increase river levels in the future, according to a team of scientists from the Met Office Hadley Centre, the University of Exeter and the Centre for Ecology & Hydrology.

The findings, published on 30 August 2007 in the journal *Nature*, suggest that increasing carbon dioxide will cause plants to extract less water from the soil, leaving more water to drain into rivers which will add to the river flow increases already expected due to climate change.

Last year, members of the research team showed that this effect can already be seen in historical river flow records. This new study, led by Dr Richard Betts, Climate Impacts Scientist at the Met Office Hadley Centre, shows that the effect of plant responses to carbon dioxide could be as important as those of increased rainfall due to man-made climate change.

The predictions are likely to be both good news and bad news. "It's a double-edged sword," said Dr Betts. "It means that increases in drought due to climate change could be less severe as plants lose less water. On the other hand, if the land is saturated more often, you might expect that intense rainfall events are more likely to cause flooding".

Dr Betts, a lead author on the recent IPCC report, added that this effect also makes it more difficult to compare carbon dioxide with other greenhouse gases which do not affect plants in the same way. "We often hear about the CO2 equivalent of other gases such as methane and nitrous oxide, used in calculating carbon footprints. But this only accounts for the effect of these gases on global warming. If we want to compare their full impacts on droughts and flooding, we need to consider direct effects on plants too".

Met Office Hadley Centre

NERC Centre for Ecology and Hydrology

Nature

IPCC

Notes:

- The Met Office is the UK's National Weather Service, providing 24x7 world-renowned scientific excellence in weather, climate and environmental forecasts and severe weather warnings for the protection of life and property.
- The Met Office Hadley Centre is the UK's official centre for climate change research. Partly funded by Defra (the Department for Environment, Food and Rural Affairs) and the Ministry of Defence, we provide in-depth information to, and advise, the Government on climate change issues.
- The Centre for Ecology & Hydrology is the UK's leading research organisation for land and freshwater science. Its scientists carry out research to improve our understanding of both the environment and the processes that underlie the Earth's support systems. It is one of the Natural Environment Research Council's research centres.
- The Natural Environment Research Council funds world-class science, in universities and its own research centres, that increases knowledge and understanding of the natural world. It is tackling the 21st century's major environmental issues such as climate change, biodiversity and natural hazards. NERC receives around £370m a year from the Government's science budget and leads in providing independent research and training in the environmental sciences.

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